

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of)	
)	
Promoting Investment in)	GN Docket No 17-258
the 3550-3700 MHz Band)	

**COMMENTS of RUCKUS NETWORKS,
a company of ARRIS U.S. HOLDINGS, INC.**

Jason E. Friedrich
Vice President, Government & Regulatory Affairs
ARRIS
101 Tournament Drive
Horsham, PA 19044

David A. Wright
Director, Regulatory Affairs & Network Standards
Ruckus Networks, an ARRIS company
350 West Java Dr.
Sunnyvale, CA 94089

December 28, 2017

TABLE OF CONTENTS

I. INTRODUCTION	1
II. EXECUTIVE SUMMARY	3
III. PAL LICENSING RULES.....	6
A. License Term and Renewability	6
B. Geographic License Area	9
C. Secondary Markets	14
IV. CONCLUSION	20

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of)	
)	
Promoting Investment in)	GN Docket No 17-258
the 3550-3700 MHz Band)	

**COMMENTS of RUCKUS NETWORKS,
a company of ARRIS U.S. HOLDINGS, INC.**

Ruckus Networks, a company of ARRIS U.S. Holdings, Inc.,¹ respectfully submits these comments in response to the Commission’s Notice of Proposed Rulemaking in the above-captioned proceeding.²

I. INTRODUCTION

Ruckus Networks has been, and continues to be, an active participant in the realization of the Commission’s innovative vision for the 3.5 GHz CBRS band. American consumers and

¹ As of December 1, 2017, Ruckus is a part of ARRIS U.S. Holdings, Inc. See Press Release, ARRIS, ARRIS Completes Acquisition of Ruckus Wireless and ICX Switch Business (Dec. 1, 2017), <http://ir.arris.com/phoenix.zhtml?c=87823&p=irol-newsArticle&ID=2319609>. Ruckus Networks is the operating name for this ARRIS company.

² See *Promoting Investment in the 3550-3700 MHz Band; Petitions for Rulemaking Regarding the Citizens Broadband Radio Service*, Notice of Proposed Rulemaking and Order Terminating Petitions, 32 FCC Rcd. 8071 (2017) (“NPRM”). Previously, Ruckus had provided comments in GN Docket 12-354 related to this matter as Ruckus Wireless, a business unit of Brocade Communications Systems, Inc.

businesses will benefit from the increased availability of spectrum, services, and competition that CBRS will enable. We have made very substantial investments (financial, research and development, and marketing, among others) into the CBRS solutions that we are now ready to deliver to the market (radio nodes, management platforms, and core services). To date, Ruckus' CBRS solutions have been utilized in 25 separate field trials and demonstrations performed by our customers and our partners. We are active in the Wireless Innovation Forum's Spectrum Sharing Committee, serving on the Steering Group and chairing the CBSD Test Task Group within Working Group 4. Ruckus was a founding member of the CBRS Alliance, continues to serve on the Board, Chairs the Marketing Working Group, and fills the Corporate Secretary position. This strong level of engagement demonstrates our substantial commitment to, and investment in, the 3.5 GHz CBRS band, which have been based upon the existing rules. We are concerned that any of the changes under consideration in this Notice of Proposed Rulemaking (NPRM) not negate or compromise our extensive efforts made over the last three-plus years. We are also concerned that this review of the CBRS rules, and the resulting current rulemaking proceeding, is creating uncertainty around both the final rules for the band and its commercial availability. We urge the Commission to conclude this rulemaking as expeditiously as possible and to do so in such a way as not to delay the commercial launch of nationwide General Authorized Access (GAA) services, which is contingent upon certification of the Spectrum Access Systems (SASs), the Environmental Sensing Capability (ESC), and the radio access equipment.

Ruckus Networks reaffirms our opposition to CBRS rule changes that would limit access to the Priority Access or General Authorized Access tiers to only certain types of users, or reduce the fundamental opportunity for access at either tier. If enacted, such changes would undermine

the global leadership that the United States has shown with CBRS in the introduction of a highly innovative three-tiered sharing framework, supporting a flexible allocation of spectrum for both exclusive and permissive access and supporting a wide variety of use cases. We continue to oppose changes at the PAL tier to PEA coverage with 10 year renewable licenses. Such changes would strand existing investments (such as Ruckus' investments as previously outlined) and would be an abrupt reversal of the Commission's previous determination that any entity should be able to secure a PAL license³ and that all CBRS implementers should be able to move fluidly between the PAL and GAA tiers⁴.

The Commission has raised a number of questions regarding possible changes to the rules for the 3.5 GHz CBRS band in this latest NPRM. Ruckus Networks is pleased to offer the following comments, focusing on a few key areas, with the goal of contributing to the development of rules that benefit all of the expected participants in the CBRS band.

II. EXECUTIVE SUMMARY

Our comments are focused on the proposals and questions raised in regard to PAL Licensing Rules.

A. License Term and Renewability

Ruckus opposes the proposed change to ten-year PAL license terms. The 3.5 GHz band and CBRS framework as outlined in the current rules are unlike other bands licensed for wireless

³ See *Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, Report and Order and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd. 3959, at ¶ 89 (2015) ("*CBRS Report and Order*").

⁴ See *Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, Order on Reconsideration and Second Report and Order, 31 FCC Rcd. 5011, at ¶ 44 (2016) ("*CBRS 2nd Report and Order*").

services (with longer license terms), due to the presence of federal and commercial incumbents with resultant protection requirements. Further, the return on investment horizons for the metro area small cell deployments envisioned by operators for this band are shorter than those for macro cellular deployments. Many operators possess metro area assets (e.g. fiber, hybrid-fiber-coax, and siting) that will enable them to deploy these small cells more quickly than “greenfield” buildouts of macro cellular systems.

However, the current three-year terms may not be sufficient for operator-led deployments. The Commission should consider PAL terms in the five-year to seven-year timeframe for the needs of operators. If such a lengthened license term were adopted for all PAL licenses, the Commission will need to take further action to provide for the protected spectrum access needs of enterprises and smaller vertical industry entities.

Any consideration of renewability should be tied to performance requirements. The SAS coordination of the band enables the use of new, more dynamic metrics that could be utilized to promote the most efficient and intensive use of the band.

B. Geographic License Area

Ruckus opposes the Petitioners’ specific request to change the PAL license areas to PEAs. The arguments laid out by the Petitioners in support of this change, rooted in the Commission’s findings in the *Spectrum Frontiers* proceeding and NPRM, are not supported by the record in that proceeding. In fact, the Commission declined to increase the license size to PEAs for the 28 GHz band, and cited many of the same factors in that determination that are applicable to the 3.5 GHz CBRS band. These factors include: propagation characteristics in the band, intended

coverage range, targeted deployments, discouragement of spectrum warehousing,⁵ license border coordination, and the overall cost-benefit of smaller licenses relative to administrative burdens. In the absence of specific deployment plans supporting the need for PEA license sizes and detailing how efficient and intensive use would be made of such large license areas – which would then need to be weighed against the use cases of the many supporters of smaller license areas (i.e. census tracts or counties) – the Commission should reject the calls for PEA license areas. To do otherwise would not be in keeping with Section 309(j) of the Act.

Ruckus does not believe that partitioning and disaggregation of PEA sized PAL license areas would meet the needs of the many commenters who have noted their desire for smaller PAL license areas, especially the enterprise and smaller vertical industry entities.

C. Secondary Markets

The light-touch leasing framework should continue to be the focus of the Commission’s secondary market policy for the 3.5 GHz CBRS band. If the geographic coverage of some or all PALs is increased beyond the census tract level, partitioning and disaggregation may be helpful in providing protected spectrum access for operators and WISPs who are not able to secure PAL usage rights at auction, but these secondary market mechanisms will not meet the needs of the many thousands of enterprises and smaller vertical industry entities who the Commission envisioned would also require protected spectrum access.

If the Commission intends for secondary market mechanisms to play a more prominent role in providing protected spectrum access for enterprises and smaller vertical industry entities, modifications and enhancements will be needed to the light-touch leasing framework.

⁵ We use the term “warehousing” consistent with the Commission’s use in this NPRM and the Spectrum Frontiers NPRM.

Specifically, the Commission will need to encourage the formation of spectrum exchanges in order to overcome the administrative burden that leasing would entail absent such exchanges. Further, strong and appropriate incentives should be defined to promote the availability of PAL usage rights to the secondary markets. Such incentives can be tied to the performance requirements for license renewal based upon dynamic SAS-derived metrics. PAL license holders could also be encouraged to make PAL usage rights available to the secondary market and to avoid spectrum warehousing via license renewal discounts based upon the percentage of the license that was made available via spectrum exchanges over the life of the license.

III. PAL LICENSING RULES

A. License Term and Renewability

Ruckus Networks opposes the proposed change to the rules to increase the PAL license term from three years to ten years. While we understand that a ten-year license term is consistent with the approach that had been taken for other licensed wireless services, the CBRS framework is inherently unlike other traditional licensed wireless services due to the presence of incumbents, the innovative tiered sharing approach that the Commission has put in place, and the expectation of a much broader and more diverse ecosystem of participants, both at the PAL and GAA tiers. While more traditional ten-year license terms are familiar and appealing to the Petitioners and their supporters, the large majority of comments to the Petitions noted that ten-year terms are too long, and the resultant licenses would be too costly, for the various use cases and business plans of those commenters.

Furthermore, the longer time horizon that the Commission has found appropriate for traditional licensed bands has been based on the economics and deployment timelines of wide-area, macro cellular deployments, typically for regional or national-scale networks. These are

systems providing coverage of up to tens of kilometers with EIRPs as high as 2500 watts.

Deployment of these systems can be very time consuming, especially where new site acquisition is required. By contrast, due to the operational rules, the CBRS band will be utilized for small cell deployments. While some of these will be outdoor metrocells operating at EIRPs of up to the statutory limit of 50 watts (for Category B CBSDs), the large majority will be indoor and outdoor picocells operating at EIRPs of up to the 1 watt limit (for Category A CBSDs).

Due to these power constraints and the propagation characteristics at the 3.5 GHz radio frequency, CBRS will not be suitable for regional or national-scale coverage. Operators are likely to deploy CBRS small cells in urban and suburban environments, either as additional capacity in conjunction with their existing footprints (mobile operators) or as a primary mobile broadband service in conjunction with MVNO relationships for rural coverage (new entrants). In fact, CTIA cited the deployments of vast networks of small cells as one basis for their petition for changes.⁶ The economics and timelines for these types of metro-scale, small cell deployments are very different than those for traditional national-scale, macro cellular deployments. The deployment timelines for these urban and suburban small cells are also significantly shorter than for macro cell sites, especially where existing assets can be leveraged, such as the hybrid-fiber-coax (HFC) plants of the MSOs and the dense urban public Wi-Fi hotspot networks which have been deployed by a variety of operators.

At the same time, we do believe there is some reason to question whether the current three-year term is sufficient to provide a reasonable expectation of return on investment for larger-scale, more complex operator deployments. As noted in the NPRM, there are a number of

⁶ CTIA Petition at 8.

organizations, such as Charter, WISPA, Motorola Solutions, and Southern Linc, who have proposed or suggested PAL terms of either five or six years. Based on these recommendations and conversations with our service provider customers, we believe a five-year to seven-year term would be reasonable for these types of operator deployments. License terms in this five to seven-year timeframe would also mitigate the barrier to exit risk that the Commission raised in regard to ten-year terms. In the event that the terms for all PAL licenses were increased, the Commission should take further action to provide for the protected access needs of enterprises and smaller vertical industry entities, as their time horizons are more consistent with the current three-year term.

Ruckus Networks believes that any consideration of PAL license renewability must be conditioned upon performance requirements that will drive the most intense use of the band and directly promote spectrum use when a license holder elects not to exercise their rights within a PAL coverage area. We believe that the SAS coordination and management of the overall CBRS spectrum environment provides a new level of detail, and a resulting increased range of metrics, upon which such performance requirements could be based. For example, traditional coverage metrics, both population and geographic, could be reported as the cumulative average over a specified period of time by the SAS. When tied to either service obligations or renewal standards, such “rolling metrics” would incentivize PAL license holders to make the most intensive use of their spectrum rights as early as possible in the term of the license and also maintain that intensive use throughout the reporting period.

Ruckus Networks does not believe that GAA use of the band, including unused PAL channels, is sufficient to discourage spectrum warehousing. GAA access is permissively available to all registered CBRS users and contains no interference protections, while PAL

access is only available for the exclusive use of the relatively few users who secure a license at auction and comes with statutory interference protections. GAA access and PAL access are in no way fungible, and GAA use does not offset, or substitute for, PAL use. The Commission should ensure that those entities who have consumed a scarce public resource by obtaining a PAL at auction make timely and efficient use of that resource. We believe that the types of duration-based performance requirements outlined above would be effective mechanisms to discourage spectrum warehousing.

B. Geographic License Area

Ruckus Networks maintains our opposition to the Petitioners' specific request to increase the license size of PALs to PEAs. Contrary to the argument referenced as background in the NPRM⁷, we do not find evidence in the Commission's *Spectrum Frontiers* proceeding to support the conclusion that the Commission has already identified PEAs as the best license size for 5G operations. In fact, while PEAs were determined to be the most appropriate license size for the 39 GHz band, the Commission explained in detail why smaller license sizes, counties in this case, were appropriate for the 28 GHz band.

Many of the points noted by the Commission as their basis for maintaining smaller license areas for the 28 GHz band are equally applicable to the 3.5 GHz CBRS band. For example, in the initial *Spectrum Frontiers* NPRM, the Commission noted, "These bands do not propagate well over long distances, and when used in mobile applications, are expected to provide coverage of areas measured in meters, not kilometers. Second, establishing smaller licenses could provide

⁷ See NPRM ¶ 20.

licensees with additional flexibility to target their deployments to those areas where they need the capacity.” and “Third, smaller license areas reduce the potential for warehousing spectrum; again, licensees will be more likely to acquire and hold only the licenses they need to meet their customers’ demand.”⁸

As noted in our preceding comments on PAL license term, the CBRS band will be utilized for small cell deployments, which typically provide coverage areas measured in tens and hundreds of meters. There will be metrocell deployments covering kilometers, but these will be a minority of the radio nodes deployed, and even in these metrocell cases the coverage ranges will be much shorter than traditional macro cellular deployments due to the maximum radiated power limit of 50 watts.

We also highlighted that operator deployments will be targeted on urban and suburban areas where the mobile broadband demand is concentrated. PAL license size should support these targeted deployments by operators, allowing them to focus on those areas where they need capacity (i.e., the metropolitan areas), instead of having license sizes so large that operators end up with fallow areas outside their desired target geographies. As the Commission noted in the *Spectrum Frontiers* NPRM,⁹ rightsizing the license area to the intended deployment scenarios and geographies has the added benefit of reducing the potential for spectrum warehousing.

Further, in its subsequent *Spectrum Frontiers* Report and Order and Further Notice of Proposed Rulemaking, the Commission not only defended and maintained its earlier proposal for smaller license areas in the 28 GHz band, but also addressed a number of other issues that have

⁸ See *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, Notice of Proposed Rulemaking, 30 FCC Rcd 11912 ¶ 111 (2015) (“*Spectrum Frontiers* NPRM”).

⁹ *Spectrum Frontiers* NPRM ¶ 111.

similarly been raised as rationale for PEA-sized licenses in this current CBRS proceeding. In particular, the Commission noted that while county-sized licenses would result in more license border protection requirements than PEA-sized licenses in the 28 GHz band, it pointed out that the adoption of a power flux density limit at these borders would facilitate coordination between licensees¹⁰. In the 3.5 GHz CBRS band the PAL-to-PAL border protections are dynamically coordinated by the SAS¹¹, resulting in virtually no administrative burden to the licensees. Finally, the Commission concluded that: “Overall, we believe the benefits of smaller license areas for this specific band outweigh any administrative burden on licensees and the Commission.”¹²

Ruckus believes that the Commission’s determination was correct in the 28 GHz band, and the guiding principles regarding propagation, intended coverage range, targeted deployments, discouragement of spectrum warehousing, license border coordination, and the overall cost-benefit of smaller licenses relative to administrative burdens, apply with equal or greater force in the 3.5 GHz CBRS band.

Ruckus notes that the arguments cited as background in this NPRM for increasing the PAL license size to PEAs are based on 1) consistency with other Commission determinations, 2) the administrative burden of smaller license sizes, 3) border coordination issues, 4) lack of market demand for smaller PALs, and 5) harmonization with other countries’ plans for 3.5 GHz. As noted in the preceding paragraphs, the first three of these arguments are not supported by the

¹⁰ See *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd. 8014 ¶ 35 (2016) (“*Spectrum Frontiers Order*”).

¹¹ *CBRS 2nd Report and Order* ¶ 138.

¹² *Id.*

facts. As to the desirability of smaller license sizes, there are numerous filings in the 12-354 proceeding clearly demonstrating the demand for PAL license sizes smaller than PEAs – specifically for either census tract or county level licenses.

In regard to international harmonization, the ongoing presence of federal and existing commercial incumbents, resulting in both the necessary restrictions on power levels and the introduction of the three-tiered sharing framework, illustrates the unique situation in the United States in this band. Additionally, as Ruckus has noted in our comments to the Petitions, other countries have either already made small license areas available in this band (e.g., the Company Specific licensing regime in 3410-3800 MHz in the Netherlands¹³) or have sought industry input on enabling localized vertical industry or micro-operator access to these frequencies (e.g., Australia, Italy, Switzerland¹⁴). Both the United States' unique realities in this band and the still evolving international outlook for the 3.4-3.8 GHz frequency range directly refute global harmonization as a basis for PEA-sized licenses in the 3.5 GHz CBRS band.

Those in favor of increasing the PAL license size have failed to provide specific service and deployment plans and explain how PEA-sized licenses are necessary to the success of those plans, and additionally how they will make efficient utilization of all the areas covered by PEA-

¹³ Agentschap Telecom, Ministerie van Economische Zaken en Klimaat *Local broadband networks in the 3.5 GHz band*, <https://www.agentschaptelecom.nl/onderwerpen/zakelijk-gebruik/lokale-breedbandnetwerken/lokale-breedbandnetwerken-de-35-ghz-band/het>.

¹⁴ Australian Communications and Media Authority *Future Approach to the 3.6 GHz Band* (2017), Autorità per le Garanzie nelle Comunicazioni *INDAGINE CONOSCITIVA CONCERNENTE LE PROSPETTIVE DI SVILUPPO DEI SISTEMI WIRELESS E MOBILI VERSO LA QUINTA GENERAZIONE (5G) E L'UTILIZZO DI NUOVE PORZIONI DI SPETTRO AL DI SOPRA DEI 6 GHZ AI SENSI DELLA DELIBERA N. 557/16/CONS* (2017), Office fédéral de la communication *Consultation publique concernant la mise au concours et l'attribution de nouvelles fréquences de téléphonie mobile en Suisse* (2017).

sized licenses (i.e. urban, suburban, and rural). And even if the Petitioners were forthcoming with detailed plans demonstrating a need for PEAs and their proposals to make efficient and intensive utilization of the entire license area, the Commission would need to consider these use cases in the broader context of the overall mix of use cases for the PAL tier, where many commenters have noted the need for smaller PAL sizes (e.g. counties or census tracts) for their intended deployments. If the Commission were to increase the PAL size to PEAs absent this type of specificity from those seeking such large license areas, and without consideration for the other use cases at the PAL tier, Ruckus Networks believes that the Commission will not have fulfilled the objectives of Section 309(j) of the Act to encourage efficient and intensive use, to provide an equitable distribution of licenses and services among geographic areas, and to allow economic opportunity for a wide variety of applications. Ruckus also notes that the Commission cited a lack of specificity regarding service plans in rejecting proposals to increase the 28 GHz band license size from counties to PEAs¹⁵.

We will more fully address the possibility of partitioning of PEA-sized PALs in the next section of our comments, but since the NPRM also raised this issue in relation to PAL geographic license area¹⁶, we provide a provide a brief synopsis here of our position on this topic. While the ability to partition and transfer portions of a larger size PAL (PEA or county) could be helpful in making protected spectrum available to regional operators, and possibly WISPs (although the historical record is not encouraging in this regard)¹⁷, partitioning and transfers of larger licenses will not scale to meet the needs of the many thousands of enterprises

¹⁵ See *Spectrum Frontiers Report and Order* ¶ 35.

¹⁶ *NPRM* ¶ 24.

¹⁷ *WISPA Comments at 18 and 25, GN Docket 12-354 (July 24, 2017)*.

and smaller vertical industry entities who the Commission anticipated will seek protected access to the band¹⁸.

C. Secondary Markets

The Commission has identified its light-touch leasing regime as the focus for the secondary markets policy in the 3.5 GHz CBRS band.¹⁹ This NPRM seeks comment on partitioning and disaggregation of PAL licenses as a possible alternative secondary market mechanism, while also noting that the Commission previously declined to allow such mechanisms in the 3.5 GHz CBRS band.

Ruckus Networks believes that the Commission's decision in the Second Report and Order to disallow partitioning and disaggregation in the 3.5 GHz CBRS band was sound. The Commission's determination was based upon the availability of the light-touch leasing process, the inherent flexibility of spectrum access within the CBRS framework, the shorter PAL license term (three years), and the smaller PAL license area (census tracts).²⁰

In the event that the Commission determines through this rulemaking that there is a need to extend the PAL license term and increase the PAL license area, we would support partitioning and transfer of PAL licenses for any resulting larger, longer term PALs for the specific purpose of making protected spectrum access available to operators and WISPs via this alternative secondary market mechanism. However, we strongly oppose the notion that such partitioning and transfers would meet the needs for protected spectrum access by the many thousands of

¹⁸ *CBRS 2nd Report and Order* ¶ 211.

¹⁹ *Id.* ¶ 210.

²⁰ *CBRS 2nd Report and Order* ¶ 239.

enterprise and smaller vertical industry entities who the Commission anticipated would seek such access. As the Commission noted, there is a large administrative burden associated with partitioning and disaggregation, and unlike the light-touch leasing framework, there is no way to implement pre-approval or immediate processing procedures, therefore each partitioning application would need to be individually processed and approved by the Commission²¹. Such an administratively intense mechanism is not suitable for the high transaction volumes and steady processing demand forecast for enterprise and smaller vertical industry entities' access to protected spectrum.

Furthermore, in the discussion of light-touch leasing, the Commission noted that: "We expect that a significant percentage of these leases will cover a short period of time or even a single event."²² Partitioning or disaggregation are obviously not suitable mechanisms to accommodate the need for short term, and even for single event, requirements for protected spectrum access.

To summarize, partitioning of larger-sized, longer-term PALs might help make protected spectrum access available to operators who do not secure PAL licenses at auction, but partitioning and disaggregation do not meet the needs of many of the other anticipated secondary market users. Because of this, the incremental benefits towards fulfilling the objectives of Section 309(j) from partitioning and disaggregation are minimal. As such, light-touch leasing should continue to be the focus of the Commission's secondary market policy for the 3.5 GHz CBRS band.

²¹ *Id.* ¶ 230.

²² *Id.* ¶ 211.

Regardless of whether or not the Commission decides to allow partitioning and/or disaggregation of PAL licenses, Ruckus strongly agrees with the principle put forward by T-Mobile that performance requirements can be utilized to provide the appropriate incentives for license holders to make protected spectrum access available to the secondary market.²³ In our view, these incentives will need to overcome and outweigh the forces that historically have inhibited the formation of robust secondary markets, namely:

- the administrative burden to the license holder,
- the loss of future optionality on use of the affected portion of the license, and
- the motivations to inhibit competition.

Without additional provisions and modifications to the Commission's existing secondary market framework to specifically address these issues, Ruckus agrees with DSA, Southern Linc, and WISPA that there is little basis to believe that PAL license holders will make spectrum available for lease or transfer. In terms of the additional provisions and modifications that should be made, Ruckus recommends the following.

The Commission has taken a number of steps to ease the administrative burden for light-touch leasing, including the pre-certification capability for potential lessees and the immediate processing procedures. However, if secondary market mechanisms become one of the Commission's primary means to provide protected spectrum access to enterprises and smaller vertical industry entities – instead of providing the opportunity for such access via auctions of smaller PALs for shorter terms - then additional enhancements to the light-touch leasing framework should be made. In particular, the Commission should revisit its earlier decision not

²³ *T-Mobile Reply Comments at 12, GN Docket 12-354 (August 8, 2017).*

to take a position on the formation of spectrum exchanges²⁴ – as these exchanges will be essential for the purposes of matching supply (PAL license holders making protected spectrum access available for lease) with demand (potential lessees registering their needs for protected spectrum access). Without the presence of one or more exchanges, the administrative burden (i.e. cost) for PAL license holders willing to lease protected spectrum access will far exceed the benefits they could derive from leasing.

The exchange(s) will provide a central point of coordination and administration, allowing PAL license holders to register protected spectrum access they are willing to lease and potential lessees to register their requirements, and then providing a market-making function in matching supply with demand. Absent one or more exchanges, it is unrealistic to believe that an efficient market for leasing PAL access rights will emerge. Therefore, Ruckus believes the Commission should revise its rules to actively encourage and promote the formation of one or more exchanges, and not simply rely upon market forces to create what will be an essential component to making a robust light-touch leasing regime a reality.

Ruckus understands and agrees with the Commission's prior determination not to take a position as to whether spectrum exchanges should be standalone or a SAS-related function²⁵. However, if the Commission intends for light-touch leasing to play a more primary role in making protected spectrum access available to enterprise and smaller vertical industry entities, Ruckus believes the Commission must take an active role in the formation of spectrum exchanges. A pragmatic way the Commission could accomplish this would be to create some

²⁴ *CBRS 2nd Report and Order* ¶ 233.

²⁵ *CBRS 2nd Report and Order* ¶ 234.

minimum criteria for exchange services (e.g. the information that an exchange would require from license holders and potential lessees, electronic means by which this information can be registered to the exchange, and any reporting requirements from the exchange to the Commission). The Commission could then solicit proposals from certified SAS administrators and other interested parties detailing how they would provide spectrum exchange services to facilitate PAL rights leasing, and particularly how they would meet the minimum criteria as specified. This should be done in conjunction with the PAL auction proceeding, and should not impact or delay the near-term certification of SASs for GAA operation.

Ruckus Networks believes that appropriate performance requirements can be utilized to incentivize license holders to make PAL usage rights available to the secondary market, consistent with the principle put forward by T-Mobile and other commenters to the Petitions. One of the obvious steps would be to stipulate that any PAL utilization by a lessee will be credited to the performance requirements and obligations of the PAL license holder who leased the usage rights. When linked to the type of “rolling metric” renewability requirements that we outlined in our preceding comments on PAL License Term and Renewability, this change would strongly encourage license holders to enter into leasing agreements for PALs where and when they do not have a usage requirement.

A further, and possibly stronger, incentive could take the form of a renewal credit that would be awarded to a license holder for making PAL usage rights available to the secondary market. As one possibility, a license renewal discount could be calculated based upon the license holder making certain threshold percentages of the license available to the secondary markets (e.g., a 10% discount for making 20% of the license available to the secondary market and a 20% discount for making 40% of the license available to the secondary market). The measurement

and reporting of such a metric could be one of the functions of the spectrum exchanges. This could be measured semi-annually and calculated over the life of the license to discourage warehousing – ensuring that PAL license holders would not game the system by waiting until the end of the license term to make the spectrum rights available. Such an incentive would also support the Commission’s goal for license holders to not overstate their protection needs²⁶.

²⁶ *CBRS 2nd Report and Order* ¶ 183.

IV. CONCLUSION

Ruckus Networks believes that the proposed change to ten-year license terms and the requested change to PEA-sized PAL license areas are not supported by the realities of the 3.5 GHz CBRS band or the record. Any adjustments to the rules should be for the benefit of all the planned participants in the band, and not favor any specific interest group over others. For this reason, any needed modifications to the PAL license term and coverage area should be accompanied by rule changes that will preserve the opportunities for protected spectrum access across the range of users and use cases. The Commission should act quickly to conclude this rulemaking and expeditiously move forward with the authorization of GAA operations in the band.

Very respectfully,

/s/ Jason E. Friedrich

Jason E. Friedrich
Vice President - Government & Regulatory Affairs
ARRIS
101 Tournament Drive
Horsham, PA 19044

/s/ David A. Wright

David A. Wright
Director, Regulatory Affairs & Network Standards
Ruckus Networks, an ARRIS company
350 West Java Dr.
Sunnyvale, CA 94089

December 28, 2017